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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/506,605	09/10/2004	Hideki Hirata	258365US0PCT	6351
22850 7590 05/23/2007 OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER VERDERAME, ANNA L	
			ART UNIT 1756	PAPER NUMBER
			NOTIFICATION DATE 05/23/2007	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/506,605	Applicant(s) HIRATA ET AL.	
	Examiner Anna L. Verderame	Art Unit 1756	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>09/10/2004, 08/08/2005</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3 and 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ikenaga et al. 4,719,171, in view of Hegel 4,785,064 ,Yukiyasu et al. JP-11279240, Brown et al WO 85/01147, and Hara et al. 2005/0148739.

In example one, Ikenaga et al. teaches an optical recording medium comprising a disc substrate (2), a 500 angstrom thick aluminum film deposited on the substrate (3), and an ultraviolet-ray-setting protective film (4) formed to a thickness of 10 μm (claim 6) onto the metal film (12/30-45). The figure on the first page illustrates light being irradiated through the light transmission layer when recording/reading information (11/67-68). Transparent resins suitable for forming the light-transmitting layer include urethane resins, methacrylic resins, and epoxy resins (12/1-4).

Hegel teaches the use of plastic optical articles such as video disks and opthamalic lenses(1/23-24). Disclosure of plastic having excellent clarity, resistance to discoloration, high strength, and high impact resistance is found at (1/30-32). Thin films disclosed at (1/63). Disclosure of diisocyanates having urethane linkages is found at (2/10). Articles of this invention have a

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birefringence of essentially zero, light transmission greater than 80%, yellow coloration less than 4 Gardener b units, a Barcol hardness greater than about 15, and a heat distortion greater than 200°C(4/63-5/4). Teaching that is desirable to minimize yellow coloration in certain plastic optical articles both at time of manufacture and after exposure to sunlight is found at (12/6-10). Tendency toward initial yellow coloration can be reduced by employing photoinitiator methyl benzoyl formate(disclosed by applicant)(12/10-13). Other photoinitiators also used by applicant, including 1-hydroxycyclohexylphenylketone, are disclosed at (12/15-22). Example one teaches monomer isophorone diisocyanate (used by applicant) in combination with pentaerythritol triacrylate(14/11-13).

Yukiyasu et al. teaches a UV-curing composition having improved surface-curability while keeping flexibility and having *little yellowing* of the coating film with time (abstract). The resin contains one or two or more of compounds (a1) chosen from isophorone diisocyanate, hexamethylene diisocyanate, Xylylene diisocyanate etc. and (a2) which is tolylene diisocyanate (0005). The composition contains (a1) and (a2) where the ratio $(a2)/(a1) \leq 2.5(0005)$. Photoinitiators taught at (0019).

In the chemical abstracts abstract C (ethylenically unsaturated compound) is disclosed as CRN 26570-48-9, B is disclosed as [(CRN 26471-62-5)+ CRN 818-61-1(2-hydroxy ethyl acrylate)], and A (identical to urethane acrylate used by the applicant in an example UA1) is disclosed [(CRN 4098-71-9(isophorone diisocyanate))+ CRN 818-61-1(2-hydroxy ethyl acrylate)] (see enclosed chemical abstracts search report). Teaching that the number average molecular weight of

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the urethane acrylate having partial saturation is between 1000-4000 is found at (0006). See examples 1 and 2 (0030-0032). Tensile strength of 60 kg/cm²(chemical abstracts abstract).

Brown et al. teaches a curable composition comprising 4,4'-methylenebis(ph isocyanate)(used by applicant as monomer(bis(4-isocyanatocyclohexyl)methane) to prepare UA3-B) and 2-hydroxyethyl acrylate(chemical abstracts abstract). The reference also discloses isophorone diisocyanate and 2-hydroxyethyl acrylate (applicant's UA1)(chemical abstracts abstract).

In synthesis example 9 Hara et al. teaches the addition of PLACCEL to hexamethylene diisocyanate(0090). Addition of PLACCEL to a diisocyanate is disclosed.

Addition of PLACCEL to 4,4'-methylenebis(ph isocyanate), compound taught by Brown et al. is equivalent to its addition to hexamethylene diisocyanate(compound disclosed by Brown et al and Yukiyasu et al.) because the atom groups involved in the polymerization reaction are identical.

Applicant's example 1 combines UA1(A), taught by Yukiyasu et al. and Brown et al, UA3(B), rendered obvious by the combination of Brown et al. and Hara et al, addition of ethylenically unsaturated compound, taught by Yukiyasu et al., and photoinitiator ,1-hydroxycyclohexylphenylketone, taught by Hegel. This composition contains the elements of the applicant's energy-ray curable composition taught in example one and therefore inherently possesses the properties recited in the claims of this application.

The applicant has the burden of showing that their invention provides a benefit that can distinguish it from the prior art.

In regard to claim 4 the applicant claims a range of 5 to 30 parts by weight A, 30-90 parts by weight B and 5-40 parts by weight C. The cited ranges are very broad. Yukiyasu et al. teaches two urethane acrylates a1 and a2 where the ratio of $(a2)/(a1) \leq 2.5$ at (0005). A UV-curable composition containing 30 parts by weight Urethane acrylate A and 30 parts by weight Urethane acrylate B would give a ratio of (a1) to (a2) of 1 which is less than 2.5. It is also noted that as claimed urethane acrylate A and B are interchangeable. The only stipulation is that A and B are not the same urethane acrylate. For example urethane acrylate A could be the same as urethane acrylate B except that in A R1 is a benzene ring and in B R1 is a hexane. Also, an artisan skilled in the art of polymers would be motivated to experiment in the broad ranges cited in claim 4 in the process of perfecting a result effecting variable.

It would have been obvious to one of ordinary skill in the art to modify the light-transmitting layer taught by Ikenaga et al. by forming the layer using the non-yellowing composition containing two urethane acrylates taught by Yukiyasu et al. where compound A is the polymer synthesized from the monomers isophorone diisocyanate and 2-hydroxy ethyl acrylate, B is the polymer formed from the monomers PLACCEL(polycaprolactonediol) and 4,4'methylenebis(ph isocyanate), C is an ethylenically unsaturated compound and the photoinitiator is 1-hydroxycyclohexylphenylketone, based on the teaching in Hegel et al. that it is

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preferable to reduce yellowing in plastic optical articles at (12/6-10) and with the reasonable expectation of forming a useful light-transmitting layer.

2. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Ikenaga et al. 4,719,171, in view of Hegel 4,785,064, Yukiyasu et al. JP-11279240, Brown et al WO 85/01147, and Hara et al. 2005/0148739, further in view of Yukomoto et al.

Yukumoto et al. teaches an optical recording medium comprising a light-transmitting layer. The thickness of the light-transmitting layer is preferably between 3 and 170 μm (claim 7) and is made of an ultraviolet curing resin (0060). It is preferable that the material of the light-transmitting layer have a transmissivity of 90% or more (0070). Use of a blue-violet laser beam having a wavelength of $\lambda=405\text{ nm}$ and employing an objective lens having a numerical aperture of $\text{N.A.}=0.85$ allows for high density recording and increased recording capacity (0013). In this example the ratio of $\lambda/\text{N.A}$ is approximately 470 nm, which is significantly below the ratio of 670 recited in the claims.

Yukomoto does not teach the use of a UV-curing composition comprising two different urethane acrylates, an ethylenically unsaturated compound, and a photoinitiator.

It would have been obvious to one of ordinary skill in the art to record/read the optical recording medium taught by the combination of Ikenaga et al. 4,719,171, in view of Hegel 4,785,064, Yukiyasu et al. JP-11279240, Brown et al WO 85/01147, and Hara et al. 2005/0148739, using a blues laser having a

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wavelength of 405 nm and employing an objective lens having a numerical aperture of $N.A.=0.85$ based on the disclosure of Yukomoto et al. and with the expectation of achieving high density recording and increased recording capacity as taught by Yukomoto et al at (0013).

Conclusion

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anna L. Verderame whose telephone number is (571)272-6420. The examiner can normally be reached on M-F 8A-4:30P.

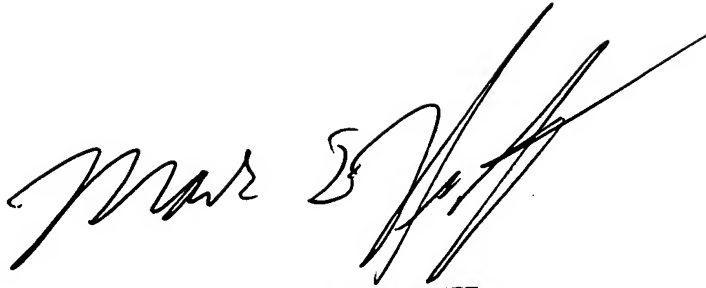
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on (571)272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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A large, stylized handwritten signature in black ink, appearing to read "Mark F. Huff".

MARK F. HUFF
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700